REMARKS

Claims 1–13, 16–22, and 24-45 are currently pending in the present application. The Examiner rejected claims 1-3, 19, 32, and 40 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,982,130 to Male ("Male") and rejected claims 4-13, 16-18, 20-22, 24-39, and 41-45 under 35 U.S.C. § 103(a) as being unpatentable over Male in view of U.S. Patent No. 6,353,510 to Drouin ("Drouin").

The Male patent is directed to a calibrating motor control system by compensating for errors in a sensed back EMF of a motor to account for inherent series resistance of a coil of the motor. Figure 1B of Male illustrates and embodiment of the system that includes a motor 10 driven by amplifiers 12 and 14 and a current sense amplifier 28 that senses current flowing through the motor. An amplifier 24 senses voltage across the motor 10 and provides and output signal that is summed with the signal from the current sense amplifier 28 and applied through an amplifier 20 to develop a VEL SENSE signal indicating the speed of the motor.

This VEL SENSE signal is fed forward via a switch F during normal operation of the system and is not fed forward, meaning switch F is open, during the disclosed calibration process (see col. 5, lines 16-22). The system executes a calibration process during which a zero-current back EMF value is stored across a capacitor Ccal, with this value indicating a speed of the motor when zero current is flowing through the motor's coil. The motor 10 is then caused to rotate at the same speed corresponding to this value but at non-zero current, and a signal AGC stored across a capacitor Cagc is then adjusted until the signal AGC equals the value across the capacitor Ccal. The signal AGC is then used during normal operation of the system to provide an offset that adjusts the value of the generated VEL SENSE signal.

Drouin discloses a storage device that repositions read/write heads from a parking location to a position adjacent a surface of a magnetic disk. The storage device includes a spindle motor coupled to the magnetic disk and controls this motor to accelerate the magnetic disk a desired number of revolutions per time period depending upon the position of the read/write head.

Amended claim 1 recites, in part, a control circuit for controlling a motor assembly having a coil with first and second nodes and having a movable arm and a

drive circuit operable to be coupled to the first and second nodes of the coil. The drive circuit receives a control signal, a current signal indicating a magnitude of a current flowing through the coil, and a speed signal. The drive circuit generates a drive signal in response to the control, current, and speed signals to drive the coil with the drive signal during drive periods, and to uncouples the drive signal from the coil during measurement periods that alternate with and are separate from the drive periods. The drive circuit generates the drive signal responsive to the speed signal only during hard-parking and hard-unparking of the movable arm.

In contrast to Male, the recited drive circuit of claim 1 generates the drive signal responsive to the speed signal only during hard-parking and hard-unparking of the movable arm. There is no disclosure nor suggestion in Male of generating the VEL SENSE signal only during these modes of operation. Moreover, Male explicitly discloses in col. 5, lines 66-67 and col. 6, lines 1-2 that when the switch F is closed the VEL SENSE signal provides "normal speed control operation using velocity feedback." This velocity signal is not utilized only during hard-park and hard-unpark operations of the system as expressly recited in amended claim 1. Accordingly, the combination of elements in amended claim 1 is allowable.

Amended claim 4 recites a control circuit for controlling a read-write head assembly only during a park or unpark operation. The circuit includes, in part, a drive circuit operable to receive a control signal, a current signal indicating a magnitude of a current flowing through the coil, and a speed signal. The drive circuit generates a drive signal in response to the control, current, and speed signals to drive the coil in response to the control and speed signals during drive periods, and to uncouple the drive signal from the coil during measurement periods that alternate with and are separate from the drive periods such that the read-write head moves to or from a ramped parking platform at a speed that is approximately five inches per second for a predetermined time period.

Even if Male and Drouin are combined the recited combination of claim 4 is not realized. Male is directed to a calibration technique as discussed above and not generally to overall control of a disk drive. Thus, if combined the system of Drouin merely implements the calibration technique of Male to compensate for the inherent

resistance of the motor so that more accurate speed control is provided. Moreover, amended claim 4 expressly recites that the control circuit controls the read-write head assembly only during a park or unpark operation and such control is neither disclosed nor suggested by Male and Drouin, whether taken together or in combination. The combination of elements recited in amended claim 4 is thus allowable.

Amended claim 8 recites, in part, a speed-sense circuit having first and second input terminals that are operable to be directly coupled to the first terminal and a second terminal of the coil such that no element is in series with the coil between the first and second input terminals, the speed sense circuit also having an output terminal coupled to the feedback input terminal of the drive circuit. The speed sense circuit senses a speed of the arm during measurement periods only during hard-park and hard-unpark operations of the arm when substantially zero current flows through the coil. As discussed above, neither Male nor Drouin discloses or suggests such speed control only during hard-park and hard-unpark operations. Therefore, the combination of elements recited in amended claim 8 is allowable.

Claim 12 recites, in part, a disk-drive system including a nondithering control circuit coupled to the coil and adapted to receive a current signal indicating a magnitude of a current flowing through the coil. The nondithering control circuit is operable to cause the coil to park the read write head by sensing a speed of the arm during measurement periods when the current signal indicates substantially zero current flows through the coil and, in response to the sensed speed, moving the read write head from over the disk onto the platform at approximately a constant speed. The combination of Male and Drouin does not disclose or suggest a control circuit that operates in the recited manner. Male does not disclose a control circuit that causes the coil to park the read write head by sensing the speed of the arm during measurement periods when the current signal indicates substantially zero current flows through the coil. In contrast, the only disclosure of such operation in Male is during the calibration period during which the inherent resistance of the motor is compensated for, and not during parking of the read write head. The combination of elements recited in claim 12 is therefore allowable.

Amended claim 19 recites a method during hard-park and hard-unpark operations of a read-write head that performs the recited operations. As previously discussed, Male does not disclose or suggest such a method only during such hard-park and –unpark operations. The combination of elements recited in amended claim 19 is accordingly allowable. Amended claim 27 recites, in part, during hard-park and hard-unpark operations of the read-write head when the sensed current is approximately zero, sampling a back voltage across the coil. Once again, Male does not discloses such operation during such hard-park and –unpark operations and the combination of elements in claim 27 is thus allowable.

Claim 30 recites, in part, a disk-drive system including a nondithering control circuit coupled to the coil and adapted to receive a current signal indicating a magnitude of a current flowing through the coil. The nondithering control circuit is operable to cause the coil to unpark the read write head by sensing a speed of the arm during measurement periods when the current signal indicates substantially zero current flows through the coil and, in response to the sensed speed, moving the read write head from the platform to a position over the disk at approximately a constant speed. The combination of Male and Drouin does not disclose or suggest a control circuit that operates in the recited manner. Male does not disclose a control circuit that causes the coil to park the read write head by sensing the speed of the arm during measurement periods when the current signal indicates substantially zero current flows through the coil. The only disclosure of such operation in Male is during the calibration period during which the inherent resistance of the motor is compensated for, and not during parking of the read write head. The combination of elements recited in claim 30 is therefore allowable.

Claim 31 recites a method that includes repeating the recited operations of sensing, uncoupling, sampling, adjusting, and coupling the adjusted drive signal one or more times only during hard-park and hard-unpark operations of the read-write head. This claim is therefore allowable for similar reasons to those discussed above with regard to claim 19.

Amended claim 41 recites a control circuit for controlling a motor assembly having a coil with first and second nodes and having a movable arm. The control circuit

includes, in part, a drive circuit adapted to be coupled to the first and second nodes of the coil and adapted to receive a control signal, a current signal indicating a magnitude of a current flowing through the coil, and a speed signal. The drive circuit is operable in a drive mode to generate a drive signal in response to the control, current, and speed signals during a hard-park submode of operation and to generate the drive signal in response to the control and current signals during a normal submode of operation. The drive circuit is further operable to apply the drive signal to drive the coil during the drive mode and is operable during a measurement mode to isolate the drive signal from the coil. The combination of Male and Drouin neither discloses nor suggests a drive circuit that operates in the recited manner. The drive circuit of Male simply does not generate a drive signal in response to the control, current, and speed signals only during a hard-park submode of operation and the combination of elements recited in amended claim 41 is therefore allowable.

All dependent claims are allowable for at least the same reasons as the associated independent claims and due to the additional limitations added by each of these claims.

The present patent application is in condition for allowance. Favorable consideration and a Notice of Allowance are respectfully requested. The Examiner is requested to contact the undersigned at the number listed below for a telephone interview if, upon consideration of this amendment, the Examiner determines any pending claims are not in condition for allowance. The undersigned also requests the Examiner to direct all future correspondence to the address set forth below in the event the Examiner shows a different correspondence address for the attorney of record. In the event additional fees are due as a result of this amendment, please charge such payment to Deposit Account No. 07-1897.

DATED this 29 day of Nov, 2005.

Respectfully submitted,

GRAYBEAL JACKSON HALEY LLP

Paul F. Rusyn
Attorney for Applicant
Registration No. 42,118
155-108th Avenue N.E., Ste 350
Bellevue, WA 98004-5973
(425) 455-5575

Enclosures:
Return Postcard